# MONITORING PLAN
# SWAMP RECREATIONAL USE STUDY
# LABOR DAY WEEKEND 2008
# CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD
# (16 July 2008)

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## Attachments



## I. INTRODUCTION

The purpose of this study is to evaluate Recreation Beneficial Use achievement at selected sites within specific water bodies in the Central Valley Region, using *E. coli* as the indicator. Sampling sites will consist of sites utilized by local stakeholders for contact recreation (specifically, swimming holes, defined as places in fresh, moving water, such as rivers, streams, creeks, springs, or similar natural bodies of water, which are large enough and deep enough for a person to swim in. This criterion excludes lakes and/or shallow stream sections).

## II. BACKGROUND

One of the purposes of the Surface Water Ambient Monitoring Program (SWAMP) is to determine whether there is any evidence that beneficial uses are not being protected. The Central Valley Regional Water Quality Control Board

(CVRWQCB) Basin Plan identifies contact recreation as a beneficial use throughout the Region. Although the Basin Plan identifies a water quality objective that utilizes fecal coliform (not to exceed 400 MPN/100mL in a single sample), *E. coli* can also be utilized as an indicator for potential pathogens and is a subset of fecal coliform. The U.S. EPA has developed contact recreation guidelines for *E. coli,* and an Amendment to the Central Valley Basin Plan is pending that would change the objective to terms of *E. coli.*

Using *E. coli* as an indicator, this study will help develop a snapshot of the water quality in local swimming holes before, during and after a major holiday (August 27 – September 3, 2008). In 2007, an initial screening study was conducted by SWAMP over the Labor Day holiday (CVRWQCB, 2008 Draft) to provide information on potential logistical constraints in conducting a broader valley wide survey. A number of recommendations came out of the pilot study including the need to sample all locations at approximately the same time of day, ideally in the afternoon when people are more likely to swim. In addition, special consideration to the availability of subcontracting laboratories and shipping couriers on a major holiday is needed during the site selection process. If samples are collected the afternoon prior to the analysis, the 24-hour hold time may be time limiting. Including a subcontracting lab requires that either the samples be collected and shipped the same day to ensure samples meet the hold time or the use a local subcontractor. The maximum number of samples that can be processed by the Water Board Laboratories and subcontracting laboratories may further limit the scope of a valley wide survey.

## III. OVERVIEW

The initial survey is anticipated to occur before, during and after Labor Day (August 27 – September 3, 2008). Central Valley Regional Water Quality Control Board (CVRWQCB) staff are responsible for coordinating the sampling events, including:

- Providing
  - Sample collection bottles to the stakeholder groups,
  - A summary of the sample collection procedures that is based on the Bacteria Monitoring Procedures Manual
  - Training (CVRWQCB, 2007), as needed, to the stakeholder participants in sample collection procedures
- Coordinating delivery of the samples to the analytical laboratories
- Conducting E. coli analyses using EPA's Standard Method 9223B (IDEXX Colilert ® QuantiTray system).
- Write up of results
- Distribution of write up directly to study participants and to the public via the CVRWQCB SWAMP Website.

## IV. TIMELINE

| Due Date | Category | Item |
|---|---|---|
| 10 March | Monitoring Plan | Internal Review Draft |
| 21 March | Supplies | Order supplies |
| 8 April | Training | Redding Staff |
| 29 May | Training | Fresno Staff |
| 30 June | Stakeholder Group Coordination | Develop Contact List (SJR) w, input from Sac, Redding, Fresno SWAMP coordinators |
| 30 June | Stakeholder Group Coordination | Staff Review Draft of Stakeholder Announcement and survey |
| 16 July | Stakeholder Group Coordination | Final Announcement/ Mail out |
| 31 July | Stakeholder Group Coordination | Stakeholder responses to mail out due |
| 7 Aug | Monitoring Plan | Quality Assurance Project Plan (QAPP) Approval |
| 8 Aug | Stakeholder Group Coordination | Electronic copies of Monitoring Plan, Procedures, and QAPP sent to interested stakeholders |
| mid Aug | Training | Redding Stakeholders Training/ Study Q&A Session/ Supply Distribution |
| mid Aug | Training | Lower Sacramento/ San Joaquin Stakeholders Training/ Study Q&A Session/ Supply Distribution |
| mid Aug | Training | Fresno Stakeholders Training/ Study Q&A Session/ Supply Distribution |
| 26 Aug | Monitoring Plan | Add addendum to Monitoring Plan with Stakeholder Group Comments to include sampling site list |
| 27Aug (W)<br>31 Aug (Su)<br>3 Sept (W) | Sample Collection | Before, During and After Labor Day Field samples |
| 28 Aug (Th)<br>1 Sept (M)<br>4 Sept (Th) | Process, and Analyze | Process samples for *E.coli* |
| 31 Sept | Writeups | Draft Data compiled and sent to participants |
| 15 Oct | Writeups | Summary Site Templates Completed and sent to participants |
| 14 Nov | Writeups | Draft Study Report for Peer Review |
| 14 Nov | Writeups | Draft Study Report for Participant Review |
| 31 Dec | Writeups | Final Report for post to website |

## V. MONITORING PLAN

This monitoring plan will be used by all participants in the study. It includes study timeline, constituents to be analyzed, sampling locations, sample collection and analysis schedule, and organization responsible for collecting the sample.

Attachment 3 provides summary procedure instructions for sample preparation and collection based on the Bacteria Monitoring Procedures Manual (CVRWQCB, 2007). The Quality Assurance Project Plan (QAPP) discusses the details of how the samples for this study are collected and analyzed to provide data that are SWAMP approved (Attachment 2).

Any changes made to the plan will be documented and amended to this Monitoring Plan.

## VI. TRAINING

San Joaquin River Watershed Unit staff will provide initial training to staff in the Fresno, Redding, and Sacramento watershed units, based on approved SWAMP compliant protocols (CVRWQCB, 2007).

Many local watershed groups have developed procedures for bacterial sample collection. However, to ensure consistency of collection and handling, the sampling protocol (Attachment 3) based on the Bacteria Monitoring Procedures Manual (CVRWQCB, 2007) developed by the CVRWQCB San Joaquin River Watershed Unit will be used. A copy of this protocol will be distributed to the local watershed groups prior to stakeholder training sessions. Stakeholders are encouraged to review all documents prior to training and bring questions and comments to the training sessions. Responses will be provided by 26 August 2008 in the form of an addendum to the monitoring plan.

## VII. SUPPLIES

Staff from the San Joaquin River Watershed Unit will order sample collection and processing supplies. These supplies will be distributed to stakeholder groups and the other Regional Board Units during the stakeholder training sessions.

Supplies to be delivered include:

| Item | Purpose |
|---|---|
| 120 mL sample bottles | Collection of sample and field duplicate |
| 290 mL sample bottles | Collection of lab split samples |
| Field Sheets (see attachment for example) | Records the sample id numbers, what will be collected, where the sample will be collected, and field data parameters |
| Bacteria Processing Worksheet | Records the sample id numbers, chain of custody, sample results, QA information |
| Labels for Quantitrays (to groups processing samples only) | Provides the sample id numbers for the person processing the samples to put on the trays |
| Colilert Media (to groups processing samples only) | Processing of samples |
| Antifoam Solution (to groups processing samples only) | Processing of samples to reduce bubbles in the Quantitray wells |
| Quantitrays (to groups processing samples only) | Processing of samples |

## VIII. STAKEHOLDER GROUP COORDINATION

An announcement and survey (Attachment 1) requesting participation from local stakeholder/watershed groups will be drafted and sent to Region 5 SWAMP coordinators for initial review. Each Region 5 SWAMP coordinator is requested to compile a list of stakeholders to be sent the announcement and survey. The contact information is to be sent to the SJR Watershed Unit so that the final announcement can be mailed in mid-July.

The mail out will include a survey form to be completed, which will provide the following information:

- Contact information
  - Stakeholder group, if applicable
  - Name
  - Phone number
  - Email address
  - Participation Interest (Site Selection, Sample Collection, Sample Transport and Draft/Final Report)
- Site information
  - Watershed
  - County
  - Site Description (i.e., American River at Sunrise Ave.)
  - GPS Coordinates & projection

### Site Selection

Sampling sites should be swimming holes that are selected based on a history of recreational use during holiday weekends. CVRWQCB staff will compile a list of 70-80 sites, based on stakeholder input. A full list of sampling sites will be amended to the monitoring plan.

Published sources may be used to locate sampling sites, to include:

- The book *Swimming Holes of California: Day Trips with a Splash,* by Pancho Doll
- http://www.swimmingholes.org/we.html
- http://www.viamagazine.com/weekenders/clearwaters05.asp

## IX. WATER QUALITY SAMPLING

Samples will be collected at local river/stream swimming holes in the Sacramento River, San Joaquin River and Tulare Lake Basins to characterize water quality associated with contact recreation beneficial use during an anticipated high use time period.

### Constituents

Water samples from all sites will be analyzed for temperature, pH, electrical conductivity, total coliform and *E. coli*. Stakeholder groups that do not have

access to equipment for EC and pH testing will need to collect an extra pint of water so that analyses can be conducted at the Water Board Laboratories. Additional samples will be collected at selected sites for *Cryptosporidium, Giardia, and E. coli O157:H7* analysis. It is anticipated that all sites will be sampled for *E. coli O157:H7* and approximately 5 sites will be sampled for *Cryptosporidium* and *Giardia*. Site selection will be based on logistics for sample transport to the analyzing laboratory and elevated E. coli concentrations in the pre-holiday weekend sample. These analyses are also dependent on the California State budget and the availability of a lab contract.

Photos will also be taken at each of the sites, during each sample collection, facing upstream of the sample collection location. Each of the three photos should frame the same picture to the extent possible.

### Sampling Frequency and Schedule

This study will consist of three sampling events:

| Collection and Process | Sample Pull | Purpose |
|---|---|---|
| Wednesday, 27 Aug 2008 | Thursday, 28 Aug 2008 | Characterizing water quality prior to high recreation use period |
| Sunday, 31 Aug 2008 | Monday, 1 Sept 2008 | Characterizing water quality during the high recreation use period |
| Wednesday, 3 Sept 2008 | Thursday, 4 Sept 2008 | Characterizing water quality after high recreation use period |

During each sampling event, the sampler indicated will complete a Water Quality Field Data sheet (Attachment 4) for each site and a Bacteria Processing Worksheet (Attachment 4) which will be used as a Chain of Custody form as well as tracking the sample analysis process.

### Sample Analysis

Samples will be analyzed in the CVRWQCB laboratories, using IDEXX Colilert ® QuantiTray system.

## X. REPORTING

Results obtained are to be validated for quality, precision, and completeness according to the guidelines set forth in the QAPP document. The data are then to be tabulated in database format compliant with the SWAMP program, saved, and maintained by the CVRWQCB. Results will be posted to the SWAMP database and the CVRWQCB website.

The CVRWQCB will also provide a write up of the results that will be distributed to all study participants as indicated in the study timeline. See Attachment 5 for the Summary Site Data Template that will be used and an example from the pilot study in 2007.

## XI. REFERENCES

1. California Regional Water Quality Control Board, Central Valley Region. SWAMP Recreational Screening Study Labor Day 2007, Draft Report, 2008.

2. California Regional Water Quality Control Board, Central Valley Region. Procedures Manual for the San Joaquin River Water Quality Bacteria Monitoring Program. 2007

3. California Regional Water Quality Control Board, Central Valley region. The Water Quality control Plan (Basin Plan), 4th Edition, 1998.

4. Environmental Protection Agency. 'Implementation Guidance for Ambient Water Quality Criteria for Bacteria' web page. 15 January 2003. <http://www.epa.gov/waterscience/standards/bacteria/bacteria.pdf>.